Patent Application of

Julie L. Patton

For

TITLE: A MECHANISM TO EXERCISE AND STRENGTHEN THE FACIAL MUSCLES THAT CONTROL AND FORM THE EMBOUCHURE

FEDERALLY SPONSORED RESEARCH

Not Applicable

SEQUENCE LISTING OR PROGRAM

Not Applicable

BACKGROUND—FIELD OF INVENTION

This invention relates to mechanisms for strengthening and enhancing the endurance of the facial muscles that form the embouchure, with the embouchure generally considered to be the way lips and tongue are applied to a mouthpiece in order to produce a musical tone.

BACKGROUND—DESCRIPTION OF PRIOR ART

Musicians, especially wind players, are burdened with the necessity of daily practice to improve as well as to maintain their facial muscle strength, which is necessary for endurance, range, tone, and control. Typically, the more developed these muscles are, the better a musician will be able to perform for longer periods of time, with improved range; accuracy; and confidence.

Originally musicians developed their muscles strictly through hours of practice with their chosen instrument(s). Specialized practice routines that emphasized specific muscles were developed to facilitate the musician's development.

Exercises involving buzzing the mouthpiece alone has been shown to increase lip response, improve tone and decrease mouthpiece pressure. Buzzing aids that attach to the mouthpiece were invented to clarify and focus the pitches, so as to improve ear training and pitch centering with the embouchure. Using the mouthpiece is typically more convenient than playing the entire instrument, as mouthpieces are easier to carry around and quieter as well.

Some musicians will simply "buzz" their lips alone as though they were playing their instrument, using their musculature to maintain their embouchure as they go through specific exercises. Some professors have advocated holding a pencil held between the lips for a period of time for the purpose of embouchure formation and strengthening.

All of these techniques have times where they might be appropriate; nevertheless they all suffer from a number of disadvantages:

(a) All of these techniques take a significant amount of time, often hours per day.

(b) Most of these techniques require making noise. This is either a musical tone or a buzzing noise. The requirement to make noise limits their application to instances where such would be appropriate or not distracting,

significantly limiting the locations and times during which a musician may perform them.

(c) Playing a musical instrument requires that the entire instrument be present. This is inconvenient and frequently not feasible.

(d) Buzzing a mouthpiece alone or with a small attachment requires having the same present. This either requires separating the mouthpiece from its instrument and risking not having it replaced when next needed, or purchasing an extra mouthpiece at a significant cost. These mouthpieces tend to be of plated brass and can be of significant weight and size themselves, particularly if being carried extensively to maximize practice opportunities. Furthermore, some of the most widely used buzzing accessories fit between the mouthpiece and the trumpet, and can't be used without having the entire instrument present.

(e) Buzzing the lips alone or with the mouthpiece will involve some splatter of saliva, which raises sanitary concerns. It also requires a starting level of muscular control not necessarily available to every player, particularly young or new instrument players.

(f) Pencils have a limited ability to vary in shape, size, weight, and torque. They are relatively large for their mass and do not fit in most pockets. Pencils typically come in one diameter. Musicians need to utilize several different apertures with their embouchure in order to work on their range and control.

(g) Pencils were never designed to be held in the mouth. They typically aren't made with food-grade materials or an appropriate coating on the portion grasped by the mouth, and they may contain lead.

Objectives and Advantages

Accordingly, several objects and advantages of the present invention are:

(a) To provide a supplemental way to strengthen the muscles that control the embouchure;

(b) To provide a mechanism that can be readily manufactured to produce the variety of diameters, weights, and torque's necessary to complement the demands on the embouchure. Depending on the instrument being played, these demands vary significantly. For example, professional trumpet players play a variety of trumpets of different size, key, and range: where the higher the key, the smaller the mouthpiece, and hence the smaller the required aperture formed by the embouchure;

(c) To provide a mechanism that can be utilized in sets to develop the full range of embouchure apertures necessary to play different volumes and registers.

(d) To provide an embouchure muscle strengthening mechanism which can be utilized without making perceptible noise;

(e) To provide a mechanism which is small enough that it can be readily carried around without it being a burden or nuisance;

(f) To provide a mechanism that will allow the musician to strengthen an appropriate range of muscles with the appropriate resistance level;

(g) To provide a mechanism that will strengthen the muscles controlling the embouchure in a shorter time period then practicing or buzzing the lips;

(h) To provide a mechanism which is sanitary when held in the mouth, with a surface that won't trap saliva and hold germs, and which may be readily sanitized with soap and water;

(i) To provide a mechanism which is safe to use, with a food-grade surface on the portion to be inserted into the mouth;

(j) Further objectives and advantages are to provide a mechanism that effectively strengthens embouchure and facial muscles, which is simple to use, and which is affordable to purchase.

SUMMARY

In accordance with the present invention an embouchure strengthening mechanism comprises a rigid segment that is grasped by the lips and a means for applying weight and torque to the rigid segment.

DRAWINGS

Drawing Figures

In the drawings, closely related figures have the same number but different alphabetic suffixes.

Figs 1A – 1C show various aspects of an embouchure muscle development mechanism with a coated surface that goes into the mouth, a projecting rod, and a weight at the end of rod.

Figs 2A – 2C show various aspects of embouchure muscle development mechanisms that do not contain additional weights and which are either coated or are covered with plastic tubing

Figs 3A – 3D show various aspects of embouchure muscle development mechanisms that incorporate sliding weights, with or without some means of stationing the weights at various distances from the lips.

Figs 4A – 4B show various aspects of embouchure muscle development mechanisms which utilize segmented rods that may include a separate mouth rod, multiple extension rod lengths, and which may include a removable end-weight or weights.

Figs 5A – 5B show various aspects of embouchure muscle development mechanisms, which may or may not have a coated segment for use in the lips, which include a movable sleeve to change the fulcrum, and which may include an additional weight at the end of the sleeve.

Reference Numerals in Drawings

10	End coating	11	Encapsulating coating
12	End tubing	13	Encapsulating tubing
14	Screw-in rigid end segment	20	Extension rod
21	Wave-form extension rod	22	Corkscrew extension rod
23	Notched extension rod	24	Drop-down extension rod
25	Threaded extension rod	30	End weight
31	Sliding weight	32	Sliding weight with stop
33	Screw-in weight	34	Sliding sleeve insert weight
40	Sliding sleeve		

DETAILED DESCRIPTION

Description—Figs 1A, 1B, and 1C—Preferred Embodiment

A preferred embodiment of the embouchure muscle development mechanism is illustrated in Fig 1A (side view), Fig 1B (end view), and Fig 1C (perspective view). The the embouchure muscle development mechanism in its preferred embodiment consists of a rod **20** with one end coated or covered by a gripping surface **10**. The rod typically being made of a strong and durable material such as metal, plastic, ceramic, or wood. The coating of the gripping surface typically consisting of an FDA approved plastisol or plastic, which is suitable for prolonged use in the mouth. The other end consists of an

appropriate weight **30** which may be formed as part of the rod or which may be attached separately.

The rod **20** would typically be 3 to 4 inches in length, depending on the mass of the rod, the mass of the attached weight **30**, the total diameter of the rod **20** and coating **10**. The length would further be modified to accommodate the level of the individual whose lips were being trained or strengthened. In the preferred embodiment the rod **20** is round, but it could have alternative cross-sections including ellipsoidal or square.

The coating **10** would typically cover the first inch of the extension rod **20**, encapsulating the end and providing a non-slip slightly cushioned surface appropriate for use in the mouth and for contact with both lips and teeth. In use an individual would typically close their teeth, insert the encapsulated end **10** until it touched their teeth, and then grasp the coated surface **10** with their lips. The total diameter of the end would typically be between 3/32 of an inch and 1/4 of an inch. The coating would typically be applied by heating the rod **20** and dipping it in a food-grade plastisol, then heating it again to cure the plastisol. In alternative embodiments the rod might first be dipped in a primer and then dipped in a plastisol to form a chemical bond between the plastisol and the rod, or the rod might contain some modification of the end such as a hole or a widened area to form a mechanical lock securing the plastisol to the rod. In other embodiments the rod **20** might itself be of a material suitable for use in the mouth and need no additional encapsulation.

The weight **30** would typically be made of a metal or other dense material and permanently affixed to the end of the rod **20**. The size of the weight would typically be set depending on the total diameter of the encapsulated end **10**, the length of the rod **20**, and the level of the person utilizing the mechanism. In other embodiments the weight could be removable, could move along the rod, could be fashioned as part of the rod, or the rod itself could be sufficiently long and heavy that its mass alone also constitutes the weight.

Figs 2-5—Additional Embodiments

Figs 2A – 2C show alternative forms of encapsulation of the rod **20** to provide an ideal surface for gripping by the lips. Fig 2A shows the entire rod coated with a plastic or plastisol **11**. Fig 2B shows the end of the rod inserted into tubing **12**, and Fig 2C shows the entire length of the rod inserted into tubing **13**.

Figs 3A – 3D show alternative forms of weights and rods. Figure 3A shows a rod **21** that is wavy in nature and a weight **31** suitable for sliding along said rod. The nature of the rod allows the weight to be positioned at set intervals along the rod, changing the torque the embouchure muscles must overcome. Fig 3B shows a rod **22** that has a corkscrew shape and a weight **31** suitable for sliding along said rod. The corkscrew nature of rod allows the weight to be positioned at any point along the rod simply by rotating the rod until a low point is at a suitable distance from the mouth. Figure 3C shows an end view of the figure

shown in 3B without the weight **31** to further illustrate its corkscrew nature. Figure 3D shows a rod **23** which has multiple notches and a weight **32** which will slide along the rod and which has a spur or incorporates a projection allowing it to positively stop at a notch. Fig 3E shows a rod **24** and weight **31** that slides along the rod and which can be positioned freely.

Figs 4A – 4B show different forms of rods and weights that can be assembled or disassembled. Fig 4A shows a 3 part assembly where a rod segment which is of a material suitable for being gripped by the lips **14** attaches to a rod segment **25** which in turn attaches to a weight **33**. The lip segment **14**, the rod segment **25**, and the weight **33** may all be of equal or different diameters and materials. Fig 4B shows a 3 part assembly where a lip segment **14** is coated with a material **10** and the rod segment **25** attaches to a removable weight assembly, **33**. The segments may all be of similar or different diameters or materials.

Figs 5A – 5B show instances where the weight takes the form of a sleeve that covers the rod beyond the point of lip contact. In Fig 5A the typical weight is replaced with a sleeve **40** that can be slid along the rod to any desired position to facilitate changing the leverage point and resultant torque upon the lips. Fig 5B shows a sleeve **41** that can slide along the rod, but which also supports an additional end weight **35** which in turn may be affixed to the sleeve or which may slide inside the sleeve.

Advantages

From the descriptions above, a number of advantages of the embouchure muscle strengthening mechanism become evident:

(a) The embouchure muscle strengthening mechanism can be used silently.

(b) The embouchure muscle strengthening mechanism is compact and can be readily taken with an individual.

(c) The embouchure muscle strengthening mechanism is highly versatile, sets of mechanisms can be configured to train musicians of any level playing any wind instrument. In some embodiments components can be carried which can be combined in a variety of ways to achieve a result most suitable for the musician.

(d) The musician can utilize a variety of diameters to train their embouchure muscles over a range of movement.

(e) The part of the mechanism that goes into the mouth is easy to clean, won't harbor bacteria, and is made up of material suitable for use in the mouth.

Operation—Figs 1 and 2

The manner of using the embouchure muscle strengthening mechanism in the preferred embodiment in Figs 1A—1C and the embodiments shown in Figs 2A—2C is to hold the head straight up, close the teeth, place the encapsulated end of the rod against the teeth, and squeeze the encapsulated end between the lips such that the rod projects perpendicular to the plane of the lips. The lips then

pull the encapsulated end away from the teeth and the teeth part slightly. This position should typically be held until the muscles tire, typically a few minutes depending on the individual and the size of the mechanism being used.

In instances where an individual posses a set of embouchure muscle strengthening mechanisms of different diameters, each diameter may be used in turn to simulate a range of motion exercise. Typically this would progress from the largest diameter to the smallest, but could take place in any order if the musician deemed that appropriate.

In instances where a musician possesses a set of one diameter but different weight and length configurations, the musician could progress from weight to weight over the course of the workout to vary the intensity, torque, and weight the lip muscles are overcoming.

Operation—Figs 3, 4, and 5

The mechanisms shown in Figs 3—5 would all be used in a fashion similar to the mechanism shown in Figs 1 and 2, however there would be additional steps to the process. The mechanisms shown in Figs 3 and 5 would be placed in the mouth in the fashion of the Fig 1 mechanism, at which point the user would adjust the weight or slide to get the torque correct. In instances where the weight or slide wasn't permanently fastened onto the rod, the user would also have the option of changing the weight or slide. Once the correct weight or slide was correctly positioned the user would continue as outlined for the Fig 1 mechanism,

but with the added choice of varying the torque during the workout, or of changing the weight or slide being supported.

The mechanisms shown in Fig 4 would be used in a fashion matching the mechanisms shown in Fig 3 with the elimination of the step to position the weight, as its position is non-adjustable. However there would be the potential addition of a preliminary step sizing and attaching the lip segment and/or the weight segment.

Conclusion, Ramifications, and Scope

Accordingly, the reader will see that the mechanism can be utilized to strengthen the muscles controlling the embouchure quickly and easily, can be carried with the musician at almost all times, and can be used in sets to stimulate the variety of embouchures necessary to play an instrument over its full range. Furthermore, the mechanism to strengthen the muscles controlling the embouchure has the additional advantages in that

- It permits the user to work on developing their embouchure muscles without making noise of a distracting nature;
- It permits the user to work on developing their embouchure muscles without having to physically hold an object to their lips, allowing them to work on their embouchure muscles while performing other activities with their hands;
- It allows the user to work on developing their embouchure muscles without having to constantly focus on what they are doing, allowing

them to perform or enjoy other activities of an unrelated nature while using the embouchure muscle developer.

- It can be properly sized for a musician's level, instrument type, and desired workout.

Although the description above contains many specifications, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. For example, the rod could have many shapes including round, oval, rectangular, etc.; the end sleeve could have many shapes, including different cross-sections or incorporating variations in the rod such as flaring at the end.

Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.